

R E M A R K S

Independent claim 1 has been substantially amended to improve its form, better define the invention and still further patentably differentiate over the prior art.

Dependent claims 2-11, which depend directly and indirectly from claim 1, have been amended to improve their form and better define the invention.

Independent method claim 12 has also been amended to improve its form, better define the invention and further patentably differentiate over the prior art.

Independent method claims 13, 14 and 16 have also been amended to improve their form and better define the invention.

Independent method claim 17 has been amended to improve its form and better define the invention.

Dependent method claims 19 and 20 have also been amended to improve their form and better define the invention.

Turning now to the rejection, in the first paragraph of page 2 of Paper No. 4, the Examiner objects to the "continuity of the claimed invention" alleging that there is "no disclosure....evident for a "chemical reaction" or synthesis". Such allegation is apparently made with respect to applicant's parent application Serial No. 501,395 filed October 22, 1965, now U. S. Patent 3,371,404.

In traversing this apparent ground for rejection, the Examiner's attention is respectfully directed to the entire specification of U. S. Patent 3,371,404, particularly certain disclosures therein when considered in light of the entire disclosure, as noted hereafter, which broadly support the instant invention. Although the subject matter of U. S. Patent 3,371,404 generally relates to a method for cladding and deforming material by intense pressure which may be

formed by a variety of methods as set forth in the disclosure, sufficient teaching is provided in such parent patent which relates to both chemical and physical reactions which take place within a reaction zone of a reaction chamber as a result of directing intense radiation from an electron gun or a laser, into such reaction chamber to cause it to react on and create a chemical reaction with material in such chamber. If the apparatus and method defining the entire disclosure is considered along with those portions of the specification which applicant will refer to hereafter and which relate to generating and causing chemical reactions to take place as a result of flowing one or more chemicals into the reaction chamber, it is evident that the broad instant claimed invention is actually disclosed in said parent patent.

The Examiner's attention is first directed to lines 1-6 of column 2 of U. S. Patent 3,371,404 wherein applicant first discloses that the reaction chamber 12 of Figs. 1 and 2, may have intermittent shock waves generated therein by "chemical" or electrical means. It is briefly noted that such "chemical" means, in light of the disclosures which follow result not only in generating high pressures and temperatures, but also in creating chemical reactions within the reaction chamber.

The Examiner's attention is next respectfully directed to lines 4-26 of column 3 of the 404 patent wherein applicant discloses to the man skilled in the art, not only the use of "one or more conduits or nozzle inlet means" for the purpose of injecting or flowing a fluid or particles into the reaction chamber, but also [at lines 8-12] the teaching that such injected fluid or material is employed:

"...to effect one or more physical and/or...
chemical reactions...on member 18." [col.3 ^{lines} 18,19]

Immediately following such disclosure, applicant then teaches:

"Material injected through duct 25 may be used to perform one or more functions of....effecting a chemical or physical reaction on said members 18"... such as softening or cleaning said surface, etching or... other chemical reaction..."

Applicant then teaches the man skilled in the art that certain of the"processing actions may be...." for processing....with shock waves and chemicals...." (col.3, lines 24-26)

Further along in column 3 of the 404 patent at lines 27-36, applicant further teaches that the flexible conduit 25, (an inlet to the reaction chamber).... may also be utilized for admitting a working fluid to the volume 12V of the reaction chamber 12 which working fluid....may contain one or more explosive chemicals...." It is noted that, during the explosive reactions effected when the disclosed chemicals are admitted to the reaction chamber, actually result in the attainment of chemical reactions within such chamber, whether they partake in such reactions with or without the material or materials being processed by such explosive reactions.

Noting the above disclosures found in parent U. S. Patent 3,371,404 to employ and flow chemicals into the reaction chamber of the patent, ^{and note} further disclosure found in the last paragraph of the specification of such patent (col.6 l.43ff) which teaches the man skilled in the art that various solid, particulate, gaseous or liquid combustible chemicals may be flowed into the reaction chamber to be reacted on by an intense beam of radiant energy, such as an electron beam or an intense light beam, generated by an electron gun or a laser. The Examiner's attention ^{also} is respectfully directed to applicant's

disclosures found in said last paragraph which teach the man skilled in the art that the apparatus previously described may be further modified or operated, as set forth at lines 33-43 wherein applicant discloses:

"For example, the sudden generation of.... an intense beam of radiant energy....such as that generated by an electron gun....or a so-called laser....may be directed into....the liquid or gas defining the working fluid.... through a transparent portion of the wall of the chamber...." (emphasis added)

Applicant then continues in lines 43-52 of column 6:

to feed to the window
"Chemical combustion or explosive reaction means....employing a solid, particulate, gaseous or liquid combustible...or explosive chemical or chemicals....may be continuously or intermittently fed to the reaction chamber....in a controlled manner....by a conveying means....operated or controlled by a servo.... which is controlled by the described master controller....and may be rapidly burned or exploded by aintense laser or electron beam...." (emphasis added)

Thus it is seen, in view of the numerous disclosures pointed out above, that the man skilled in the art is taught not only to provide a reaction chamber, but also to provide a window therein made of high temperature glass or ceramic material [column 6 lines 37-40] and also to provide a laser or electron gun for passing a high intensity laser beam or pulses of laser energy through such window into the reaction chamber and he is also taught to continuously or intermittently admit one or more highly reactive particulate, gaseous or liquid combustible or explosive chemicals [column 6 lines 42ff and column 3 lines 4ff] as a flow through a conduit or nozzle inlet means to the reaction chamber wherein the high intensity beam radiation obviously intersects same and creates a chemical reaction by transferring its radiation to the chemical or chemicals so constantly or intermittently flowed into the reaction chamber. While it is true that the

major thrust of U. S. Patent 3,371,404 and the claims thereof define a method for cladding and deforming solid material, sufficient disclosure is actually present in the specification, and in the drawings thereof to teach the man skilled in the art that he may actually create chemical reactions within a reaction zone in which a solid to be physically or chemically reacted on is disposed, by flowing, in a stream of gaseous, liquid or solid particles, one or more reaction chemicals and directing such electron or high intensity light beam radiation from a source, (an electron gun or laser,) through a window into the reaction zone to intersect the material which is flowed or flowing therein.

As indicated in detail above, sufficient disclosures are found at a substantial number of locations of the specification to teach a man skilled in the art to construct a reaction apparatus and perform a process or method therewith in which one or more reaction materials or chemicals are flowed through a nozzle or conduit as a stream into such reaction chamber and to further react on such chemical or chemicals with intense radiation generated in the form of a beam directed along a select path into the reaction chamber, to actually effect a chemical or chemical reactions therewith.

In view of the lengthy arguments and presentations set forth above indicating that applicant has actually disclosed the broad instant invention in the specification and drawings of U. S. Patent 3,371,404, and the fact that said U. S. Patent has been cited in all of the parent applications, and further in view of the fact that such disclosure was carried forward into applicant's application Serial No. 710,518 filed March 5, 1968 [now U. S. Patent 3,566,645 patented March 2, 1971] and the applications which followed

including Serial No. 012,082 filed February 17, 1970 and Serial No. 165,445 filed July 26, 1971; Serial No. 737,446 filed October 29, 1976 and Serial No. 592,968 filed March 23, 1984, all of which contained the broad instant claimed invention involving the flow of matter in a fluid or fluent state along a select path, the generation of intense radiation as a beam and the direction of such radiation against such fluid matter at a select location, it is submitted that applicant may rightfully define the instant claimed invention as having been constructively reduced to practice on October 22, 1965 with the filing of said parent application Serial No. 501,395 [U.S.P. 3,371,404] on that date.

Turning now to the rejection on art it is noted that claims 1-20 were rejected under 35 USC on Hoskins [USP 3,404,045 filed January 11, 1965]; Scheiner [USP 3,528,897 filed December 7, 1967] and Rich et al [USP 4,012,301 filed July 28, 1975]. Applicant respectfully traverses the rejection of claims 1-20 on these references for the following reasons:

Rich et al was filed July 28, 1975 long after applicant constructively reduced the instant claimed invention in parent application Serial No. 501,395 filed October 22, 1965 as well as in numerous applications filed thereafter before July 28, 1975. Furthermore, this reference fails to disclose many of the features and claimed subject matter present in the instant application.

Scheiner relates to a photolysis process involving, amongst other sources of radiation, a laser beam. While the office has only provided applicant with the first page of such reference, it is noted that there are no disclosures on such first page which relate to certain features present in the claims currently under prosecution such as the first means for forming a first stream of first matter and flowing

said first matter in a given direction, etc. of claim 1; the "controllably directing a fluid as a stream of fluent material along a select path, etc." of claim 2 and the "controllably flowing a stream of fluent material containing particles of matter....through a portion of a select path" as set forth in claim 17 as well as numerous additional features found in the claims which depend from such three independent claims. Of most importance is the fact that the filing date, December 7, 1967, of Scheiner is substantially after applicant constructively reduced the instant claimed invention to practice as set forth above.

With respect to the reference Hoskins, USP 3,405,045, it is noted that this patent not only fails to disclose the instant claimed invention but was filed January 11, 1965, approximately eight months prior to the filing of applicant's parent application Serial No. 501,395. Applicant submits that he may rightfully swear back of the Scheiner patent, if necessary, as he conceived and recorded the broad instant claimed invention at two locations of a notebook, prior to the filing date [January 11, 1965] of such reference. At pages 75 and 76 of one notebook applicant disclosed a reaction vessel having a laser or electron gun mounted thereon for directing a continuous or pulsed beam of radiation against a fluid flowing through the reaction chamber for causing chemical reactions between the material or materials of such fluid. The disclosure also includes projecting a beam of intense light or electron through a stream of flowing fluid to cause chemical reactions to take place. At pages 183-185 of such notebook, applicant also disclosed subjecting material of a fluid to the intense light of a laser wherein

the fluid comprises two or more gases or liquids to create chemical reactions therein.

Latter reference Hoskins [filed January 11, 1965] relates to a method for inducing chemical reactions with lasers wherein a so-called "giant pulse laser system" is employed to generate and pass a laser beam laterally through a cylindrical container 18 to irradiate a chemical solution 19 therein in which photosynthesis takes place. This reference clearly does not teach the instant claimed invention since all of the claims, as amended herein, relate to both apparatus and methods for creating chemical reactions in which matter to be reacted on is generated and flowed as one or more streams of fluent material directed along one or more paths which are intersected by a laser or electron beam. The reference Hoskins does not at all disclose or suggest such an apparatus or method. Therefore, the reference may not be properly applied in rejecting any of claims 1-20, as amended herein. However, in the event that the Examiner deems it necessary, applicant will file an Affidavit Under Rule 131 swearing back of Hoskins and it is respectfully requested that the Examiner telephone applicant before the next Office Action, if he requires such an Affidavit and proof of making the instant claimed invention prior to the filing date of Hoskins. It is noted that applicant's notebook disclosures were witnessed by a number of persons including engineers and attorneys who duly understood the inventions defined in the disclosures witnessed.

In view of the foregoing arguments and presentations traversing the rejection of the claims currently under prosecution and the amendments to the claims requested

herein, it is submitted that all of the claims currently under prosecution patentably differentiate over the art of record and are allowable.

It is also respectfully requested that applicant be provided with a complete copy of U. S. Patent 3,528,897 for his records, since he only received the first page thereof with Paper No. 4.

It is also requested that applicant's mailing address be changed to:

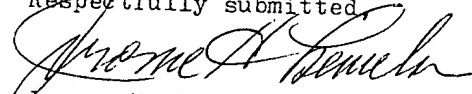
48 Parkside Drive
Princeton, New Jersey 08540

and that the previous mailing address in Metuchen, New Jersey be cancelled.

In the event that the Examiner deems it necessary for applicant to file an Affidavit Under Rule 131 swearing back of Hoskins in order to overcome such reference, it is respectfully requested that he call applicant at the following telephone number:

609-683-4444.

Respectfully submitted


Jerome H. Lemelson
Applicant